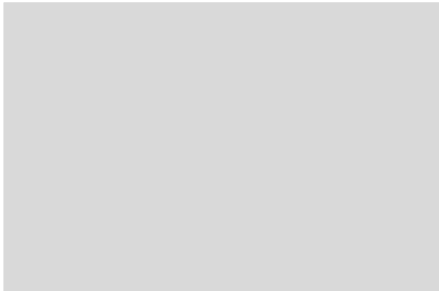


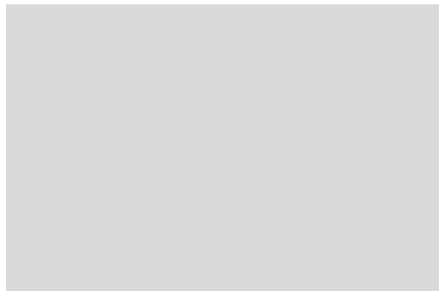


Removing LNG Barriers on EU Gas Market Comparison East-West markets



Piotr Kuś, Director, Brussels Office
GAZ-SYSTEM S.A.

CEER Workshop
Athens, 12 September 2016



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AGENDA



1 GAZ-SYSTEM – facts & figures

2 Natural gas market and infrastructure in the CEE region

3 Opportunities for LNG in the CEE region

4 Conclusions

MAIN INFORMATION ON GAZ-SYSTEM S.A.

GAZ-SYSTEM IN NUMBERS*:

10.996 km
LENGTH OF TRANSMISSION
NETWORK

881 GAS STATIONS

65 SYSTEM POINTS

14 COMPRESSOR STATIONS

100% SHARES HELD
BY STATE TREASURY

* Infrastructure data as of 31 December 2015

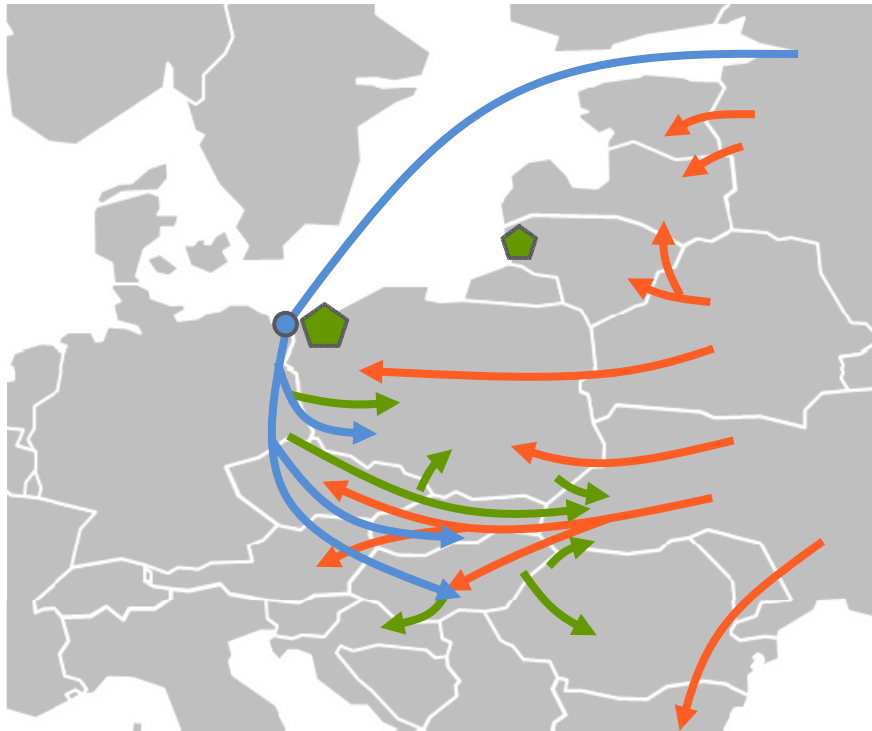
KEY FACTS:

- ▶ Natural gas TSOs in Poland established in April 2004
- ▶ Fully unbundled company providing services on non-discriminatory basis
- ▶ Certified operator of the transmission system and of the Yamal-Europe pipeline in Poland
- ▶ Operator of a virtual point in the transmission system in Poland (VTP)
- ▶ Major TSO in the CEE region with a number of successfully completed investments
- ▶ Key integrator and facilitator of market development in CEE and in the Baltics
- ▶ Company committed to the liberalisation of the regional gas market

THE STRATEGY:

- ▶ **Security of supply.** Ensuring safe operations of the transmission system as part of the European gas network
- ▶ **Market development.** Creating optimum conditions for the development of a liberalised market in Poland
- ▶ **European partner.** Strengthening the position of GAZ-SYSTEM as an integrator of the gas markets in the Baltic & CEE regions
- ▶ **Sustainability.** Development of gas infrastructure to enable increased consumption of natural gas as an environmentally-friendly fuel

NATURAL GAS FLOWS IN THE CEE REGION



SITUATION BEFORE 2009:

- ▶ Transit oriented infrastructure (East-West running pipelines)
- ▶ High exposure to supply disruptions
- ▶ High dependency on gas supplies from Russia
- ▶ Fragmentation – limited attractiveness for upstream players and traders

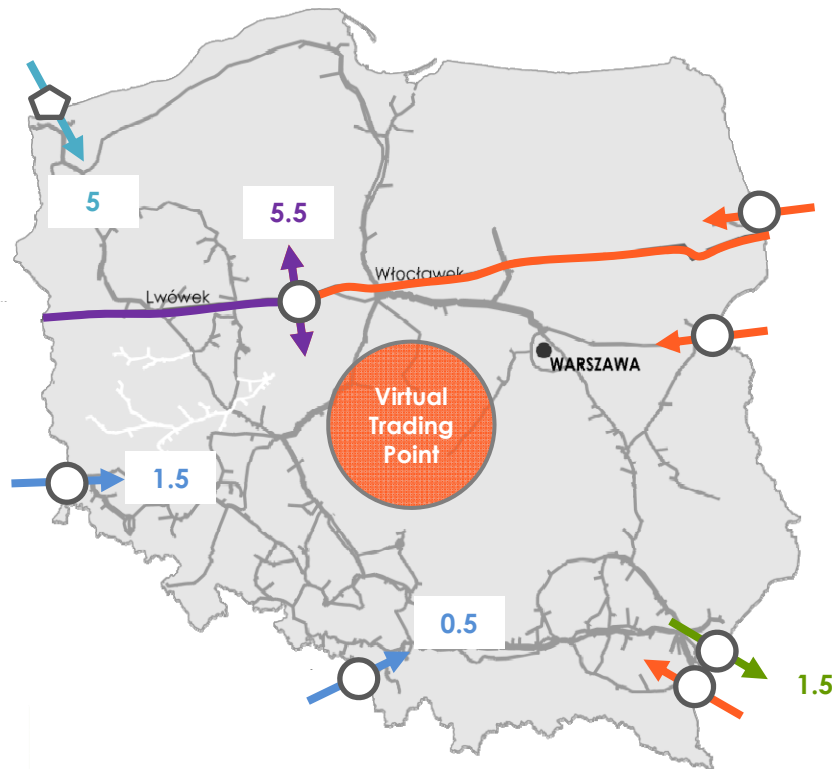
IMPROVEMENTS MADE AFTER 2009:

- ▶ New investments commissioned – reverse flows, new cross-border interconnections, first LNG terminal
- ▶ The first step made towards integration of the region
- ▶ In parallel, the liberalisation of the gas markets in the CEE region kick started

POSSIBLE FUTURE SCENARIOS:

- ▶ New, substantial projects to increase import capacities from the existing, dominant supplier
- ▶ The impact on diversification of gas supply, market liberalisation and infrastructure integration in the CEE

NATURAL GAS MARKET IN POLAND



New transmission capacities (bcm/y)



INFRASTRUKTURA I ŚRODOWISKO
NARODOWA STRATEGIA SPÓJNOŚĆ

European
Energy Programme
for Recovery



MARKET OVERVIEW

- ▶ Poland as the biggest natural gas market in the region – approx. 16 bcm/y
- ▶ Annual production of natural gas at the level of approx. 4.5 bcm
- ▶ Limited share of natural gas in the Polish primary energy consumption (approx. 13%)
- ▶ Decreasing dependence on imports from one direction, national production covers remaining 30%

NETWORK OVERVIEW

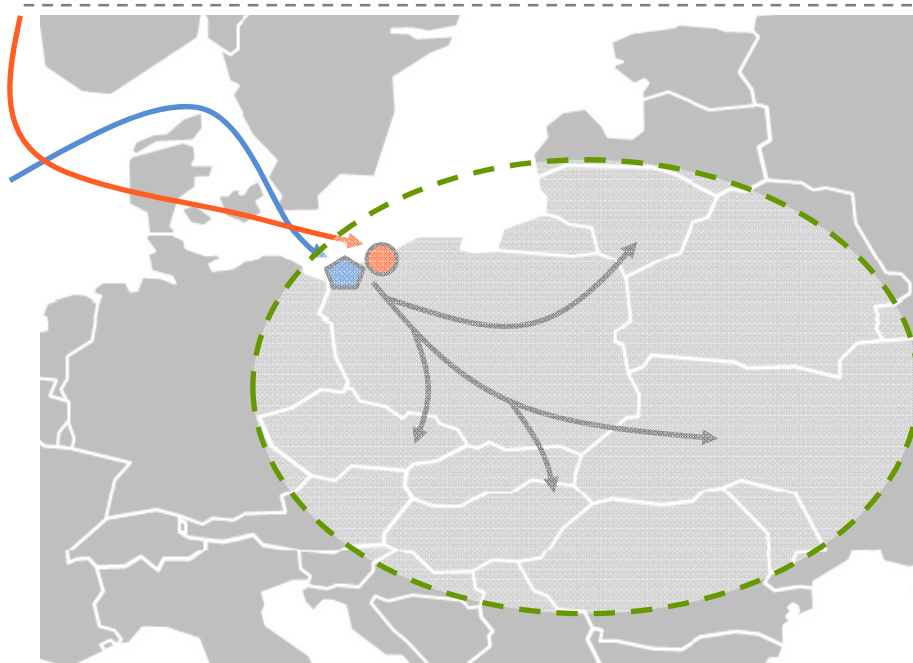
- ▶ **East-West running pipelines**
- ▶ Three existing interconnections with the EU countries:
 - ▶ **PL-CZ Interconnection (Cieszyn)** launched in Sep 2011
 - ▶ **PL-DE Interconnection (Lasów)** with increased capacities as of Jan 2012
 - ▶ **Reverse Flow on the Yamal Pipeline (virtual + physical)** as of Nov 2011
 - ▶ These projects increased import capacities to Poland by 30%
- ▶ **New flow in PL-UA direction**
- ▶ Since Nov 2012 GAZ-SYSTEM offers natural gas transport to Ukraine via Hermanowice
- ▶ Upgrade of the point of interconnection between the Yamal pipeline and the transmission system in Poland as of Jan 2015
- ▶ **LNG terminal in Świnoujście** as the first source of physical diversification in the CEE region (commercial operation as of Jun 2016)

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THE NORTERN GATE – NEW SUPPLY CORRIDOR IN CENTRAL-EASTERN EUROPE

ASSUMPTIONS BEHIND NEW SUPPLY CORRIDORS:

- ▶ Three different sources of supply
- ▶ Flexible and well-developed natural gas infrastructure
- ▶ Entry-exit zone in the region with competitive tariffs
- ▶ Increasing volumes of gas transported through the system



LNG TERMINAL IN ŚWINOUJŚCIE:

- ▶ **Regasification capacity:** 5 bcm/y in the first stage, up to 10 bcm/y following the planned extension
- ▶ **Timeline:** construction works and start-up phase completed, commercial operations as of July 2016
- ▶ **Project role:** the first physical source of supply diversification in the CEE, a gate to the global LNG market

BALTIC PIPE:

- ▶ **Capacity:** up to 10 bcm/y
- ▶ **Timeline:** project at the pre-investment stage (feasibility study ongoing), commissioning in 2022
- ▶ **Project role:** direct access to Norwegian supplies for the CEE region, positive influence on competition between suppliers and security of supply

CONCLUSIONS:

- ▶ Complementary role of LNG terminal in Świnoujście and Baltic Pipe in terms of security of supply, diversification and competition
- ▶ Both projects will significantly increase diversification of supply directly in Central and Eastern Europe
- ▶ Key role of cross-border interconnections linking Poland and adjacent systems (Ukraine, Czech Republic and Slovakia)
- ▶ This potential should be utilised on a regional level to integrate networks, diversify supplies, enhance competition and improve attractiveness of the regional market towards upstream players

LNG TERMINAL IN ŚWINOUJŚCIE

Regasification Capacity

5,0 bcm/y (570 000 cm/h) – the 1st stage

Up to 10 bcm/y (856 000 cm/h) – possible extension

LNG Offloading

Facility designated to receive Carriers from 120,000 to 216,000 cm (Q-flex vessels)

Carriers characteristics, draught: 12.5 m, length: 315 m

Storage

Two storage tanks with capacity of 160,000 cm each.

Possibility for construction of third additional storage tank (space reserved)

Capacity booking

Booked: 370 000 cm/h

Available: 200 000 cm/h

Full TPA provided to interested customers

Timetable

Construction works: completed in Oct 2015

Start-up: Q4 2015 – Q2 2016

Technical Start-up phase concluded with success

(Two cargos received, deliveries injected to the network, installation cooled)

Commercial operations: Jun 2016 (first commercial cargo received on 17/06/16, spot cargo on 25/06/16)



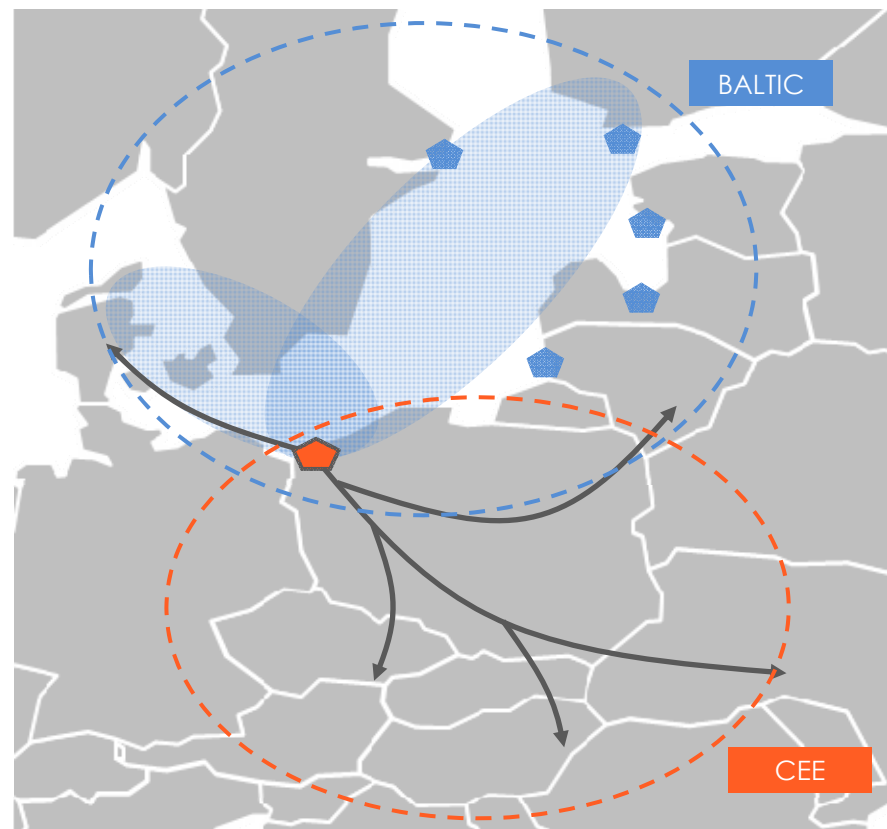
REGIONAL ROLE OF LNG TERMINAL IN ŚWINOUJŚCIE

CREATING NEW SUPPLY OPPORTUNITIES FOR THE REGION

- ▶ **BALTIC** - LNG regasified and transferred to the gas transmission system in Poland and the Baltic region (in the future also via small-scale)
- ▶ **CEE** – LNG supplies provided to the CEE region and Ukraine via the North-South Gas Corridor

LNG AS A NEW, ALTERNATIVE FUEL

- ▶ New, additional services will be provided to the system users in the region, fostering the deployment of LNG as the reliable, competitive and sustainable fuel:
 - ▶ LNG truck loading services
 - ▶ LNG bunkering services
 - ▶ LNG reloading to smaller vessels
 - ▶ LNG storage services
 - ▶ LNG in transport sector



LNG Terminal in Świnoujście as the key component of
the strategy for diversification of gas supplies in the CEE and Baltic regions

LNG TERMINAL IN ŚWINOUJŚCIE – GAS QUALITY

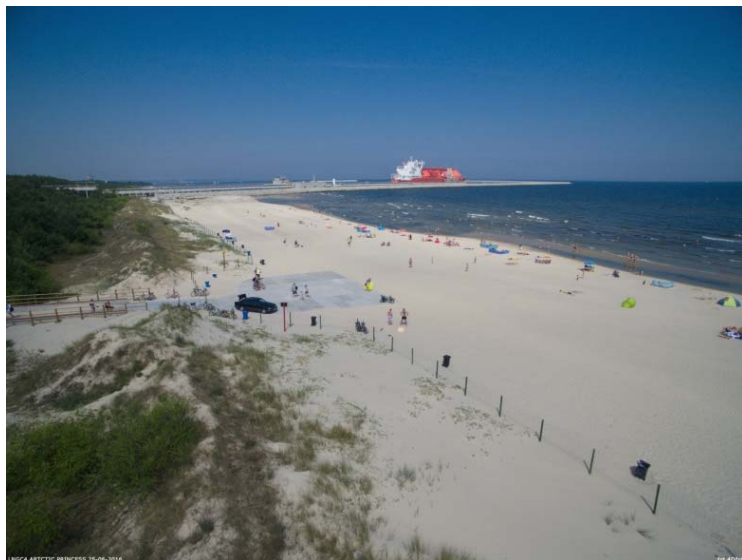
Name [% mol]	Light LNG	Normal LNG	Heavy LNG
C1	95,40	91,30	87,00
C2	3,20	6,00	8,37
C3	-	1,50	3,00
i-C4	-	0,50	0,60
n-C4	-	0,50	0,60
n-C5	-	0,10	0,23
N ₂	1,4	0,10	0,20
Boiling temp. (°C)	-163,7	-159,3	-159,2
Density (kg/Nm ³)	440,2	454,0	470,4
Molecular weight	16,66	17,79	18,72
LHV (kJ/Nm ³)	36 292	39 334	41 119
HHV (kJ/Nm ³)	40 237	43 514	45 424
Wobbe index (MJ/Nm ³)	53,00	55,45	56,43

Natural Gas from the Terminal

Heating value:
from 11,222 kWh/m³ (40,40 MJ/cm)
to 12,5 kWh/m³ (45 MJ/cm)

Wobbe index:
from 14,444 kWh/m³ (52 MJ/cm)
to 15,555 kWh/m³ (56 MJ/cm)

LNG TERMINAL IN ŚWINOUJŚCIE – 1ST SPOT DELIVERY (25 June 2016)



LNG IN THE CEE REGION - CHALLENGES

INFRASTRUCTURE

- ▶ Transmission infrastructure dominated by historical flows
- ▶ Low level of interconnectivity between national transmission systems
- ▶ Upgrades and more flexibility in the networks are needed

MARKETS

- ▶ Low level of diversification, basically no physical diversification in the region
- ▶ Exchange and hub-based trading gradually developing, yet still LT supply structures dominate
- ▶ Strong position of incumbent companies with a high-level of concentration on the supply side
- ▶ Weak incentives for natural gas/LNG as an alternative fuel (lack of environmentally friendly exercise duties and taxation systems supporting use of natural gas/LNG, lack of support schemes for deployment of clean technologies in sea/road transport)

LNG IN THE CEE REGION - CHALLENGES

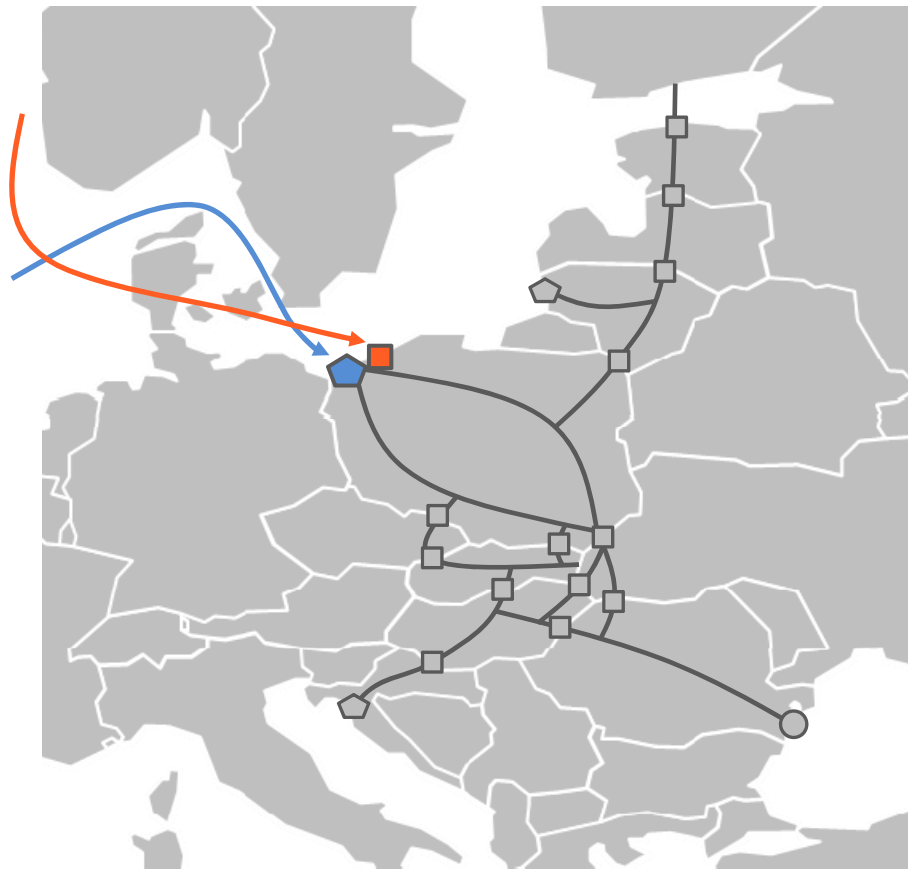
REGULATORY FRAMEWORK




- ▶ Price regulation (slow, gradual withdrawal of regulatory oversight on natural gas price setting mechanisms)
- ▶ Wholesale gas trading license obligation (especially in the CEE and SSE regions)

COSTS

- ▶ High cost of new infrastructure such as LNG terminals for the markets which are currently starting to develop (low penetration of natural gas in energy mix, small per capita usage)
- ▶ Considerable cost of entry into the transmission system
- ▶ High costs of regasification services (need to incentivize LNG usage and build solid customer base)

PROVIDING NEW POSSIBILITIES TO THE CEE REGION



-  LNG terminals
-  Cross-border interconnections
-  National production



PROJECTS

- ▶ Targeted approach to infrastructure needs
- ▶ Internal pipelines and interconnections to provide regional integration

SUPPLY

- ▶ Integrated regional market in the CEE and SEE regions
- ▶ Attracting new supply potential: LNG, NO, SGC, indigenous sources

LEVERAGE

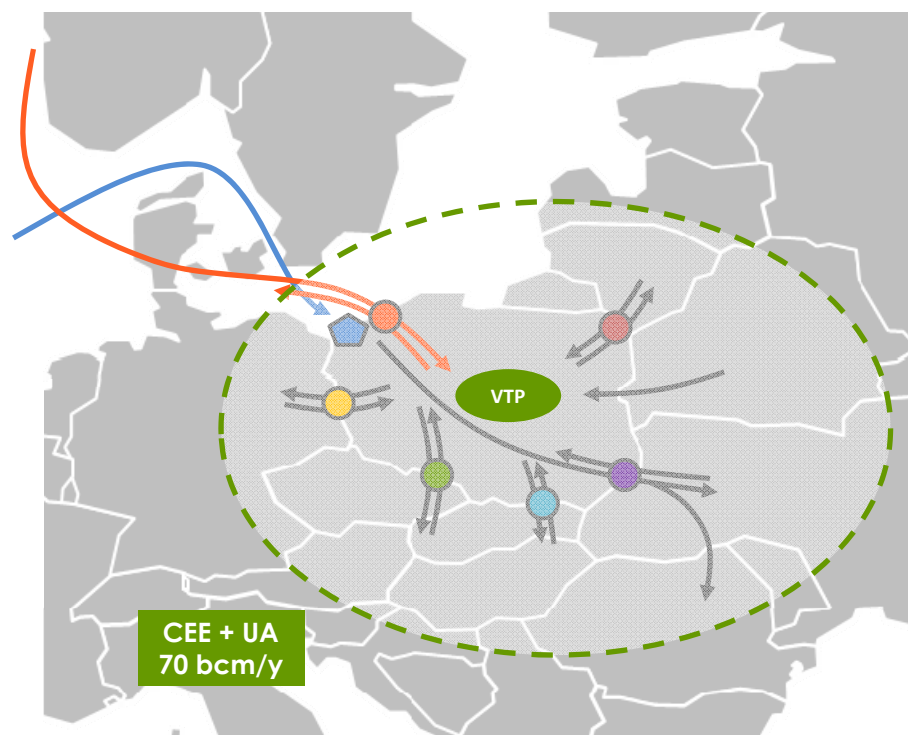
- ▶ Relatively low costs of new infrastructure provide leverage for lower commodity prices for end-users
- ▶ Enhancing economic performance of the economies in the region via lower energy cost gas-to-gas competition

SOFTWARE

- ▶ Implementation of the EU network codes and market based solutions
- ▶ Creating conditions for regional trading

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CREATING REGIONAL NATURAL GAS MARKET



POLAND – UKRAINE INTERCONNECTION:

- ▶ **Capacity:** 5-8 bcm/y towards UA, 5-7 bcm/y towards PL
- ▶ **Project role:** connection of Poland's and Ukraine's systems to diversify gas supplies for Ukraine and further integrate transmission networks and markets in Eastern Europe

POLAND – CZECH REPUBLIC INTERCONNECTION:

- ▶ **Capacity:** 5 bcm/y towards CZ, 6.5 bcm/y towards PL
- ▶ **Project role:** integration of the gas markets by creating a large transportation corridor between both countries

POLAND – SLOVAKIA INTERCONNECTION:

- ▶ **Capacity:** 4.3 bcm/y towards SK, 5.7 bcm/y towards PL
- ▶ **Project role:** integration of the gas markets by creating a large transportation corridor between both countries

POLAND – LITHUANIA INTERCONNECTION:

- ▶ **Capacity:** 2.4 bcm/y towards LT, 1.7 bcm/y towards PL
- ▶ **Project role:** integration of the isolated gas markets in the East Baltic region, diversification of supply

CONCLUSIONS:

- ▶ Cross-border projects of GAZ-SYSTEM at advanced stage and ready to deliver expected results
- ▶ Investments facilitate new possibilities to create an integrated regional market of approx. 70 bcm/y
- ▶ The influence of the projects on:
 - ▶ creating attractive supply-mix for the region
 - ▶ enhancing economic competitiveness of the region's economies
 - ▶ providing leverage for lower commodity prices for end-users

CONCLUSIONS

▶ **Characteristics of the current CEE natural gas market situation:**

- ▶ Relatively immature market compared to NW Europe
- ▶ Strongly dominated by RU supplies largely based on oil-indexed pricing formula
- ▶ Fragmented and not attractive for new major suppliers – highly exposed to supply disruptions

▶ **Crucial need for new infrastructure to create a liquid and competitive natural gas market:**

- ▶ New infrastructure developments are necessary to build a market area with a secure and diversified supply portfolio and to increase competition
- ▶ Market integration through implementation of the North – South Gas Corridor (number of coordinated infrastructure projects with the PCI status)
- ▶ Software - necessary regulatory developments enabling more integration and cross-border trading

▶ **Solutions and benefits:**

- ▶ Increased affordability and accessibility of LNG terminals regasification services
- ▶ Increased competition on local gas markets; especially in the CEE and SSE regions
- ▶ Increased pressure on current gas suppliers and stronger price competition (LNG terminal in Lithuania is a good example how terminal influenced price decrease even before its commissioning)
- ▶ Increased security of supply, in particular in countries in the CEE and Baltic regions where LNG is the most perspective source of gas to diversify gas supply and increase competition



Thank you for your attention



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